

No. 883,413.

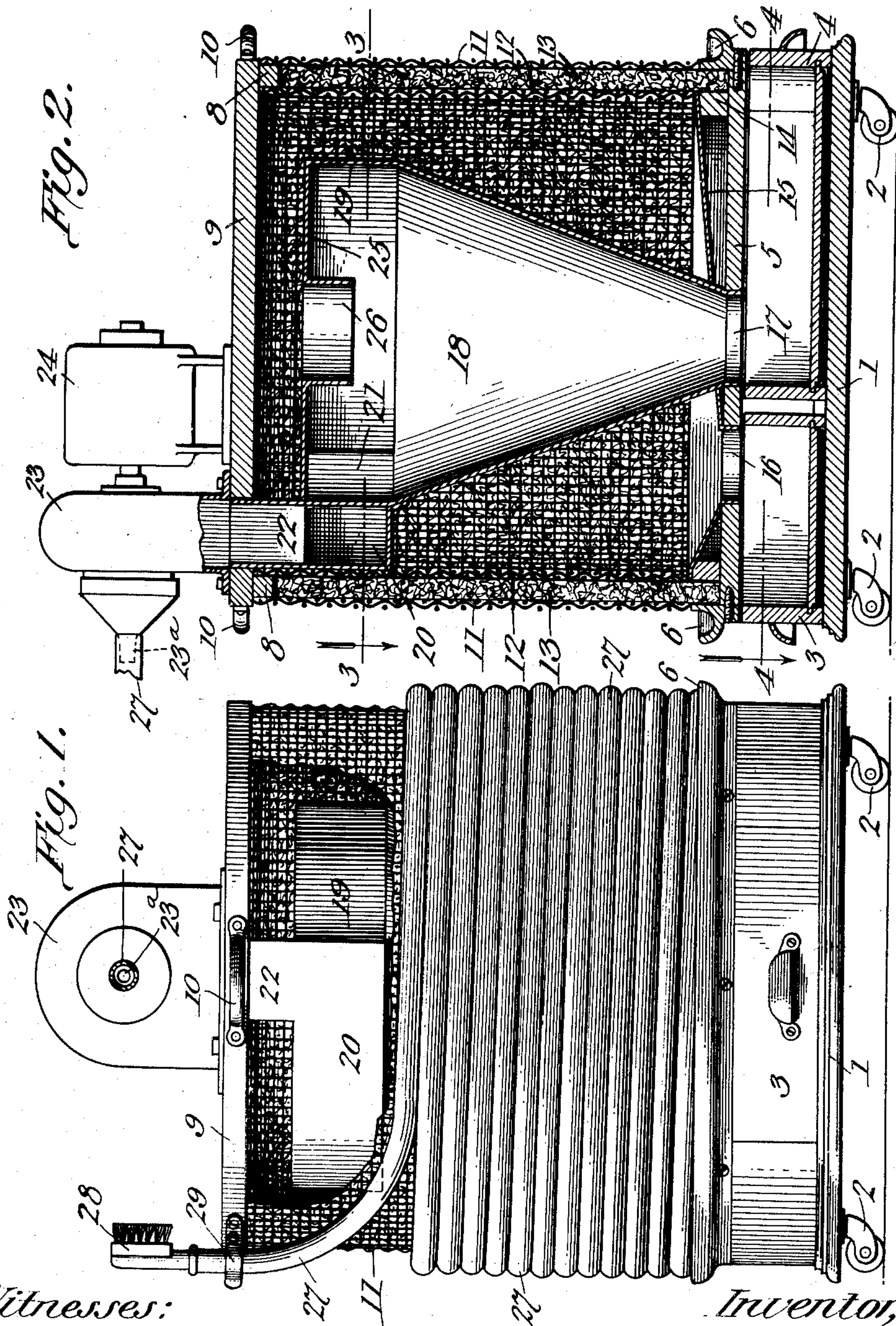
PATENTED MAR. 31, 1908.

W. F. MAHONY.

PNEUMATIC DUST COLLECTOR.

APPLICATION FILED JULY 20, 1907.

2 SHEETS—SHEET 1.



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Fig. 4.

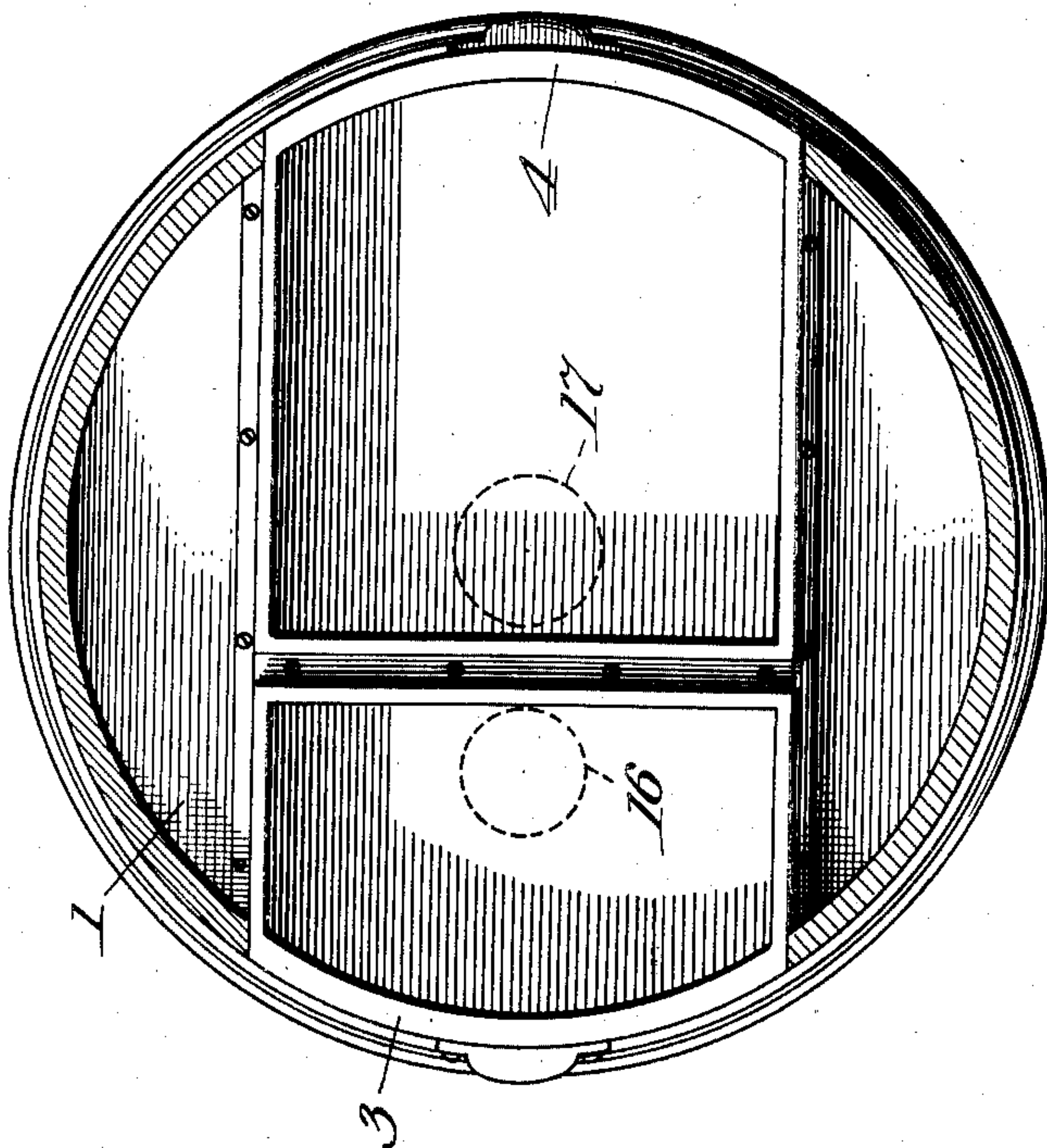
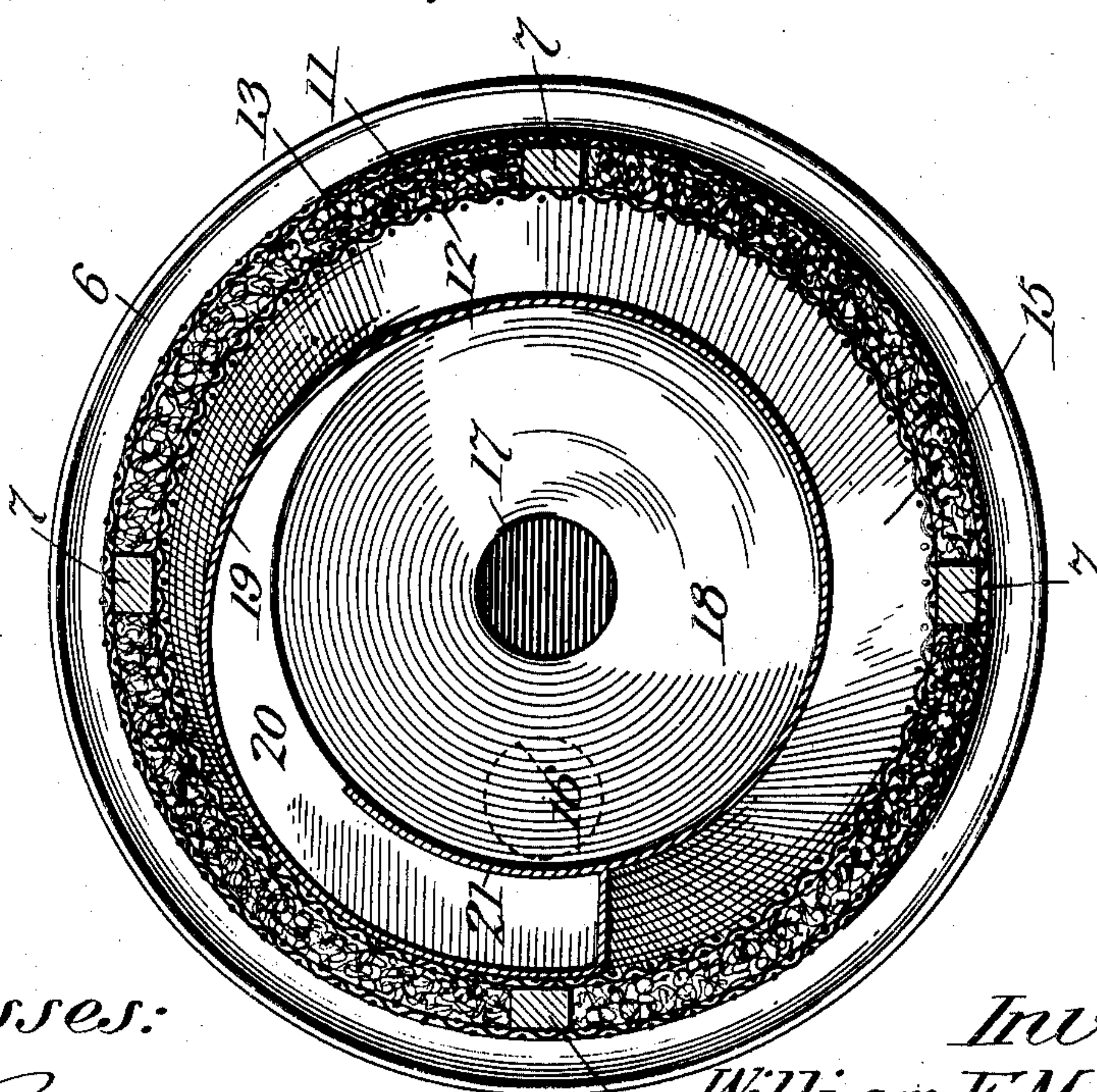


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM F. MAHONY, OF WASHINGTON, DISTRICT OF COLUMBIA.

PNEUMATIC DUST-COLLECTOR.

No. 883,413.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed July 20, 1907. Serial No. 384,705.

To all whom it may concern:

Be it known that I, WILLIAM F. MAHONY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Pneumatic Dust-Collectors, of which the following is a specification.

My invention relates to pneumatic dust collecting apparatus, and more particularly, to a portable type of machine of such size and capacity that it may be conveniently used in places where it is impractical or undesirable to adopt the larger types of dust collectors now in use; and one which may be effectively operated by suction apparatus of low pressure type suitable for domestic use.

The primary object of my invention is to provide an apparatus of this character in which the dust may be conveniently and completely collected and easily removed from the machine, and in which the coarser particles will be separated from the finer by centrifugal action.

A further object of my invention is to provide means for conveniently supporting the flexible hose usually employed with such apparatus.

With the above and other objects in view, my invention consists in the arrangement and construction of parts hereinafter described, and illustrated in the accompanying drawings in which:—

Figure 1 is a side elevation of my improved machine, part of the wall being broken away. Fig. 2 is a central longitudinal section taken on a plane at right angles to that of Fig. 1. Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2. Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2.

Referring to the drawings in detail, my improved machine comprises a base 1, mounted on casters or rollers 2. Adapted to fit within the base 1 are two removable dust boxes or drawers 3 and 4, one of which is adapted to receive the finer particles, and the other the coarser particles of dust.

Above the dust boxes is arranged a platform 5, and extending upwardly from this platform are a plurality of posts 7 (shown in Fig. 3). These posts support at their upper end a frame work 8, to which is secured the top 9, of the machine.

Extending between the top 9 and platform 5, and embracing the post 7, is the porous wall of the dust collector. This wall prefer-

ably comprises concentrically arranged cylinders 11 and 12 formed of coarse wire gauze, between which is arranged a packing 13, of cotton waste or other similar material. It will be seen that a wall, thus constructed, will permit of air seeping through readily, but will effectually prevent the escape of dust.

Disposed adjacent the platform 5 is an annular frame 14 on which rests the bottom, 15, of the dust casing. It will be observed that this bottom 15 is hopper-shaped, having a discharge opening 16 formed at the lowest point thereof. This opening, however, as will be seen, is eccentrically arranged, and is disposed immediately over the dust box 3. Centrally arranged within the dust collector casing is a funnel shaped chamber 18 having its lower discharge end 17 extending through the bottom 15, and through the platform 5, and disposed immediately above the dust box 4. It will be observed that the chamber 18 is substantially of the shape of an inverted cone, and is provided at its upper or larger end with a vertical portion 19, over the top of which extends a cover plate 25. This cover plate is provided, centrally, with an opening formed with a depending, annular flange 26, around the same.

By reference to Fig. 3 it will be seen that the wall 19 of the chamber 18 is extended for approximately half a turn, with a spiral configuration, thus forming between itself and the inner wall 21, a conduit 20. As shown in Figs. 1 and 2, a flue 22 extends from this conduit 20 to the fan casing 23. This fan casing is mounted on the top 9 of the machine, and the fan is directly connected to any suitable motor 24, preferably, electric. A flexible hose 27 on the fan casing, has one end fitted on to a nipple 23^a and is provided at its other end with any suitable form of suction nozzle 28.

Surrounding the dust collector casing, and secured to the platform 5, is an annular trough 6, clearly shown in Fig. 2. This trough is designed to support the hose 27, when, as shown in Fig. 1, the hose is disconnected from the fan casing, and coiled around the dust collector, when the machine is not in use. In this position also, the end of the hose, carrying the suction nozzle, is supported by means of a spring clip 29 secured to the top 9, of the casing.

Owing to the fact that the arrangement is such as to necessitate the mounting of the fan and motor near one edge of the dust case,

and owing to the further fact that these parts are usually quite heavy, I provide, in order to facilitate the ready moving of the apparatus from place to place, handles 10, secured to diametrically opposite sides of the casing, and located so that they are in line with the axis of the fan and motor. This arrangement will prevent the uneven movement of the apparatus which would result were the handles placed in any other manner.

The operation of my improved dust collector is as follows: The dust-laden air drawn in through the hose 27 passes through the fan casing 23, through the flue 22, and into the conduit 20. It will be observed by reference to Fig. 3, that this conduit 20 is tangentially arranged in relation to the chamber 18, and therefore, when the current of air is discharged into the chamber 18 from this conduit, a whirling or cyclonic motion is imparted to the air contained in the chamber. Owing to this cyclonic action, the heavier and larger particles of dust are thrown outwardly by centrifugal force, and, striking the walls of the chamber slide down the same and are discharged through the lower end 17 of the chamber, into the dust box 4. At the same time, owing to the shape of the chamber 18 and the manner in which the current of air is delivered thereto, a vortex is created along the axis of the chamber 18, and the air, laden with the finer particles of dust, rises upwardly in a stream and escapes through the opening 26 into the dust collecting casing. The air then gradually seeps out through the walls of this casing, while the fine dust is deposited within the same, and settling down, collects upon the hopper-shaped bottom 15. In this connection it is to be noted that the dust casing is comparatively large, so that the air may readily diffuse through the walls thereof, and the pressure in the casing always remain low.

After using the apparatus for a given length of time it will be observed that, by slightly tilting the machine toward the left (Fig. 2), and gently tapping or jarring the casing, the fine dust will be caused to slide down the sloping sides of the bottom 15, and be discharged through the opening 16, into the dust box 3.

The purpose of the depending flange 26 is to prevent the larger particles of dust from being driven directly out of the chamber 18 before the whirling motion is imparted to them. The said flange acts as a baffle plate for the air current, and prevents any draft or blowing which might otherwise occur. The dust boxes 3 and 4 are intended to fit with a substantially air tight joint so that the only outlet for the air entering the casing will be through porous walls thereof.

It will thus be seen that I have provided a very compact, simple and efficient pneumatic

dust collecting apparatus, and one which readily lends itself to domestic service, and it is thought that the numerous advantages of my improved machine will be readily appreciated by those skilled in the art.

What I claim is:—

1. In a pneumatic dust collecting apparatus, a cylindrical casing, having porous walls, means for delivering dust laden air thereto, and a hopper-shaped bottom for said casing, having its discharge opening disposed eccentrically of said casing, whereby, by tilting said casing, the collected dust may be caused to gravitate toward said opening.

2. In a pneumatic dust collecting apparatus, a cylindrical casing having walls through which air may seep, means for delivering dust laden air thereto, a hopper-shaped bottom for said casing having a discharge opening eccentrically formed therein, and a removable dust box located beneath said opening.

3. In a pneumatic dust collecting apparatus, a casing having porous walls, a chamber having impervious walls mounted wholly within said casing and provided with a discharge opening communicating therewith, and a conduit for delivering dust laden air directly into said chamber.

4. In a pneumatic dust collecting apparatus, a casing having porous walls, a chamber mounted wholly within said casing and communicating therewith at its upper end, means for delivering dust laden air into said chamber, and a discharge mouth formed at the lower end of said chamber.

5. In a pneumatic dust collecting apparatus, a casing having porous walls, a bottom therefor having a discharge opening formed therein, a chamber having impervious walls mounted within said casing and communicating therewith at its upper end, and a discharge mouth formed at the lower end of said chamber and projecting through the bottom of said casing.

6. In a pneumatic dust collecting apparatus, a casing, a chamber having imperforate walls disposed wholly within the same, means for delivering dust laden air under pressure directly into the upper end of said chamber with a cyclonic action, and means for delivering said air from said chamber into said casing.

7. In a pneumatic dust collecting apparatus, a casing, an inverted cone-shaped chamber having imperforate walls disposed wholly within said casing and a tangentially arranged inlet conduit communicating with said chamber the large end of said chamber having a central opening, communicating with said casing.

8. In a pneumatic dust collecting apparatus, a casing having porous walls, an inverted cone-shaped chamber having im-

pervious walls disposed wholly therein, means for delivering dust laden air directly into said chamber only and imparting thereto a whirling motion, thereby separating the coarser particles of dust, and means for discharging the finer particles into said casing.

9. In a pneumatic dust collecting apparatus, a casing, a separating chamber disposed therein, means for delivering dust laden air to said chamber, a hopper-shaped bottom to said casing having a discharge opening, and also provided with an opening through which the lower end of said chamber projects, a dust box under said chamber for collecting particles of one kind, and a dust box under said discharge opening for collecting particles of another kind.

10. In a pneumatic dust collecting apparatus, a dust collector, a fan and motor mounted thereon, a flexible hose connected with said fan, and adapted to be coiled around said dust collector, and an annular trough secured to said dust collector and serving to support said hose when coiled.

11. In a pneumatic dust collecting ap-

paratus, a dust collector, a fan and motor mounted on top thereof, a flexible hose attached to said fan, and adapted to be wound around said dust collector, means for supporting said hose, when so wound, a nozzle on the end of said hose, and a spring clip attached to said dust collector and serving to support said nozzle when not in use.

12. A pneumatic dust collecting apparatus comprising a frame mounted on rollers, a dust collector mounted in said frame, a fan and motor coupled together and mounted on top of said dust collector eccentrically thereof, and a pair of handles attached to opposite sides of said dust collector, said handles being approximately in line with the axis of said fan and motor, substantially as, and for the purpose specified.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM F. MAHONY.

Witnesses:

A. V. CUSHMAN,

ARTHUR L. BRYANT.